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574910

Convention Application for a PatentI,  
WeSIEMENS AKTIENGESELLSCHAFT

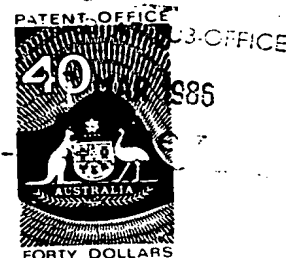
of

Wittelsbacherplatz 2,  
D-8000 Munchen 2,  
Federal Republic of Germany

hereby apply for the grant of a Patent for an invention entitled

"A COUPLING RACK FOR CLASSFIBRE CABLES"

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED 26.5.88which is described in the accompanying complete specification.  
This application is a Convention Application and is based on the  
application numbered P 35 11 653.6

for a patent or similar protection made in

Federal Republic of Germany

on 29 March, 1985

My  
Our address for service is:Care: SPRUSON & FERGUSON  
PATENT ATTORNEYS  
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AUSTRALIA.St Martins Tower  
31 Market StreetThe Common Seal of  
Siemens Aktiengesellschaft  
was hereto affixed in the  
presence of

Siemens Aktiengesellschaft

Dated this TWENTY-SEVENTH day of FEBRUARY,

1986  
Drost  
ProkuristDr. Fuchs  
ProkuristTo:  
The Commissioner of Patents

## COMMONWEALTH OF AUSTRALIA

THE PATENTS ACT 1952

DECLARATION IN SUPPORT OF A  
CONVENTION APPLICATION FOR A PATENTIn support of the Convention Application made for a  
patent for an invention entitled:AUSTRALIA  
CONVENTION  
STANDARD  
& PETTY PATENT  
DECLARATION

Title of Invention

"A COUPLING RACK FOR GLASSFIBRE CABLES"

Full name(s) and  
address(es) of  
Declarant(s)

I/We Peter Drost  
Procurist  
of Franziskanerstraße 14, D-8000 München 80  
Federal Republic of Germany

LODGED AT SUB-OFFICE

22 APR 1986

Sydney

do solemnly and sincerely declare as follows:-

Full name(s) of  
Applicant(s)1. ~~I am/We are the applicant(s) for the patent~~

(or, in the case of an application by a body corporate)

1. I am/We are authorised by Siemens Aktiengesellschaft  
(Berlin und München)

the applicant(s) for the patent to make this declaration on  
its/their behalf.

2. The basic application(s) as defined by Section 141 of the  
Act was/were made

Basic Country(ies)

in Federal Republic of Germany

Priority Date(s)

on 29 March, 1985

Basic Applicant(s)

by Siemens Aktiengesellschaft

Full name(s) and  
address(es) of  
inventor(s)

3. ~~I am/We are the actual inventor(s) of the invention referred  
to in the basic application(s)~~

(or where a person other than the inventor is the applicant)

3. JOHANN FÜLLER of Hause Nr. 18,  
D-8206 Oberholzham bei Bruckmühl and  
of HERMANN RUTZMOSER of Wirtstrasse 13,  
D-8000 München 90, both in the  
Federal Republic of Germany

(respectively)

is/are the actual inventor(s) of the invention and the facts upon  
which the applicant(s) is/are entitled to make the application are  
as follows:

The said applicant is the assignee of the  
actual inventors.

Set out how Applicant(s)  
derive title from actual  
inventor(s) e.g. The  
Applicant(s) is/are the  
assignee(s) of the  
invention from the  
inventor(s)

4. The basic application(s) referred to in paragraph 2 of this  
Declaration was/were the first application(s) made in a Convention  
country in respect of the invention(s) the subject of the application.

Declared at München this 5th day of February, 19 86

  
Peter Drost

Signature of Declarant(s)

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(12) PATENT ABRIDGMENT (11) Document No. AU-B-55314/86  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 574910  
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(54) Title  
COUPLING RACK FOR GLASSFIBRE CABLES

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(56) Prior Art Documents  
48688/85 G02B 6/38  
46170/85 G02B 6/38  
40995/85 G02B 6/44, 6/36

(57) Claim

1. A coupling rack for joining glassfibre cables and providing an interface to sensor devices for the further processing of signals transmitted via the individual fibres, in which a mounting wall arranged substantially centrally in the rack carries clamping devices for the individual glassfibre plug connectors which form each coupling, said clamping devices extending in respective slots, so that each can be withdrawn in a direction transverse to the longitudinal axis of the coupling rack and hold the individual plug connectors clamped at an angle of approximately 45° to the longitudinal axis for the assembly of a coupling, and then be pushed back into a modular position, wherein each clamping device consists of a sliding component attached so that it can be inserted and locked in horizontal

(11) AU-B-55314/86  
(10) 574910

-2-

slots in a mounting wall with a latching action to hold it in the open position, and which has a projection extending towards the front side of the module and represents a clamp assembly inclined by approximately 45° relative to the assembly wall, and grips an inserted plug connector from each side.

COMMONWEALTH OF AUSTRALIA  
PATENTS ACT 1952

574910

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

55314/86

Class

Int. Class

Complete Specification Lodged:

Accepted:

Published:

Priority:

Related Art:

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Complete Specification for the invention entitled:

"A COUPLING RACK FOR GLASSFIBRE CABLES"

The following statement is a full description of this invention,  
including the best method of performing it known to us

/

SUMMARY:

A COUPLING RACK FOR GLASSFIBRE CABLES:

For a terminal or junction coupling rack for glassfibre cables (31,32) the plug connectors (1) are arranged in extendible  
5 holders (7,8) which can be clamped and locked, thus facilitating the assembly of the plug connectors (1) within the limited installation space of rack modules (2a) of construction type 7R.

FIGURE 2


A COUPLING RACK FOR GLASSFIBRE CABLES:

The invention relates to coupling racks for joining the ends of glassfibre cables together, and/or to devices for further processing of the signals transmitted via the individual fibres.

5 In racks of this kind an interface must be provided to bring an optically flat end face of a fibre into intimate contact with that of an ongoing fibre, or with a coupling surface of a photo-electric sensor or the like. To permit reconnection, testing or replacement, such interfaces must be capable of being separated,  
10 so that an assembly of plug connectors is required between the cable side and the ongoing cable or associated sensor, in each case.

One object of the present invention is to provide a suitable device for holding a plurality of such plug connectors  
15 and providing good accessibility in densely packed compact assemblies.

The invention consists in a coupling rack for joining glassfibre cables and providing an interface to sensor devices for the further processing of signals transmitted via the individual  
20 fibres, in which a mounting wall arranged substantially centrally in the rack carries clamping devices for the individual glassfibre plug connectors which form each coupling, said clamping devices extending in respective slots, so that each can be withdrawn in a direction transverse to the longitudinal axis of the coupling  
25 rack and hold the individual plug connectors clamped at an angle of approximately  $45^\circ$  to the longitudinal axis for the assembly of a coupling, and then be pushed back into <sup>a</sup>the module rest position,





The invention will now be described with reference to the drawings, in which:-

Figure 1 schematically represents a perspective view of one exemplary embodiment of a glassfibre cable coupling rack with an inserted coupling section, constructed in accordance with the present invention;

Figure 2 is a simplified schematic exploded view giving fragmentary details of the coupling section with its clamp-type plug connectors;

Figure 3 is a set of sectional views, end, side and plan, showing a clamping device in detail;

Figure 4 is a similar set of sectional views of the holder used in the Figure 3 embodiment;

Figure 5 is an exploded view for explaining the assembly of the clamping devices; and

Figure 6 is a fragmentary detail of a partially assembled clamping device, in a part-sectional view.

Glassfibre plug connectors 1 are accommodated in a glassfibre cable coupling rack 2 in a so-called coupling zone 3 which consists of two rack modules 2a. Because there is limited installation space in the narrow rack construction of the type 7R, it is necessary to adhere to a very small spacing interval for the vertical arrangement of the glassfibre plug connectors 1. On the other hand the shape of each glassfibre plug connector 1, which comprises three screwed components 4, 5 and 6, requires sufficient operating space to permit joining, checking and adjustment to be performed.

Plug connectors of this kind are known, per se from the German Specification AS 27 41 585<sup>82</sup> and the standard DIN 47 295/7 for example. Each plug connection is arranged to be held in a clamping device 7 so that it can be withdrawn from the front of the rack module 2a.

Figure 2 represents details of the arrangement on an enlarged scale. In order to economise on space and in order to comply with permissible bending radii for the glassfibre cables 31 and 32 the plug connections in the coupling rack are arranged obliquely, for example slanting at an angle of 45° to the vertical in an elongate, narrow rack whose longitudinal axis is vertically disposed. The third clamping device from the top has been shown in the withdrawn state.

Each clamping device 7 is preferably designed as an injection moulded synthetic resin component, and extends, via lugs 9, screws 10, washers 11 and nuts 12, engaged in slots 13 of a mounting wall 14, to permit sliding between front and rear stops (Figure 3). The end positions are fixed by a latch 17 which snaps with a spring action behind the edges 15 and 16 of the slots 13, which serve as stops. At the front each clamping device 7, together with a pressure grip 18 and pressure spring 19, together form the actual holder 8 of that plug connector. For this purpose the cable-side plug pin 4 is clamped into a recess 20 of the holder 8 via a mobile, U-shaped pressure component 18 with a gripping strip. This holder, which is preferably cast

on to the sliding component, is rotated by the angle  $\alpha \sim 45^\circ$  in relation to the mounting wall 14, in order to facilitate the passage of the cable in the rack.

The holder 8 has been shown separately in Figure 4.

5 The clamping force is produced by the pressure spring 19, which is clamped between an attachment 21 of the pressure component 18 and an attachment 22 of the holder 8. In order to further facilitate operation, in the withdrawn state the pressure component 18 is tilted so that its rear attachment 23 latches into engagement  
10 with an edge 24 of the opening 25, as shown in the lowermost illustration in Figure 4. In this position an adequate gap is ensured for insertion of a plug pin 4. Plug pins having different external contours can be held. The lock is broken by a short pull so that the pressure component can be levelled and slides  
15 back into the clamping position.

When the clamping device 7 is withdrawn from its rear end position in the rack, the clamping action of the holder 8 is assured by the greater force of the pressure spring 19 in comparison to the resistance of the latch 17.

20 Advantageously the three members 4 to 6 of a plug connection 1 can be completely freely assembled, and need only be clamped into the holder 8 in the manner described when united to provide an adequately precise interface.

No additional connecting elements are required to assemble the sliding component 8 and the pressure component 18, as is shown in Figures 5 and 6. The design of the spring, together with the spring chamber 33 and receiving mandrel 34, is contrived to be such that following the positioning of the pressure spring 19 (Figure 6), the pressure component 18, which has been inserted into the sliding component 8 via the opening 25 can simply be pulled forward into the insertion position for the plug pin 4, as described above. The sliding component is thus safeguarded from falling out since the spring cannot be further compressed.

In order to protect a plug pin 4 in the uncoupled state, prior to the coupling assembly of the plug connector with a coupling 5 and the associated plug pin on the on-going or sensing device side 6, a protective cap 29 is secured by a flexible strip 26 and lug 27 to a mushroom-shaped attachment 28 on the sliding component, so that it can be folded to accept the free end 4 of an uncoupled plug pin.

The claims defining the invention are as follows:

1. A coupling rack for joining glassfibre cables and providing an interface to sensor devices for the further processing of signals transmitted via the individual fibres, in which a mounting wall arranged substantially centrally in the rack carries clamping devices for the individual glassfibre plug connectors which form each coupling, said clamping devices extending in respective slots, so that each can be withdrawn in a direction transverse to the longitudinal axis of the coupling rack and hold the individual plug connectors clamped at an angle of approximately  $45^{\circ}$  to the longitudinal axis for the assembly of a coupling, and then be pushed back into a module rest position, wherein each clamping device consists of a sliding component attached so that it can be inserted and locked in horizontal slots in a mounting wall with a latching action to hold it in the open position, and which has a projection extending towards the front side of the module and represents a clamp assembly inclined by approximately  $45^{\circ}$  relative to the assembly wall, and grips an inserted plug connector from each side.

2. A rack as claimed in claim 1, in which each clamping device consists of a U-shaped pressure component axially acted upon by a pressure spring to engage an inserted plug component against a stop on the front of a holder, and the rear flank of this pressure component is inserted via an opening into a chamber of the holder in which, in the inserted state of the pressure component, the spring can



be placed on to a mandrel of the flank and pressed through a front opening of the spring chamber until it reaches a lower stop.

3. A rack as claimed in claim 2, in which the pressure component can be tilted towards the axial position so that the rear edge of its rear flank can be locked in relation to the rear edge of the opening.

4. A rack as claimed in claim 3, in which the spring chamber, the spring and the pressure component are dimensioned such that, with the spring inserted, the pressure component is prevented from fully disengaging from the opening when the clamp connection is opened.

5. A rack as claimed in any preceding claim, in which the pressure force of the spring is greater than the clamping force of the latch.

6. A coupling rack for joining glassfibre cables, substantially as described with reference to the drawings.

DATED this THIRTEENTH day of MAY, 1988  
SIEMENS AKTIENGESELLSCHAFT

Patent Attorneys for the Applicant  
SPRUSON & FERGUSON

*SPM*

FIG 1

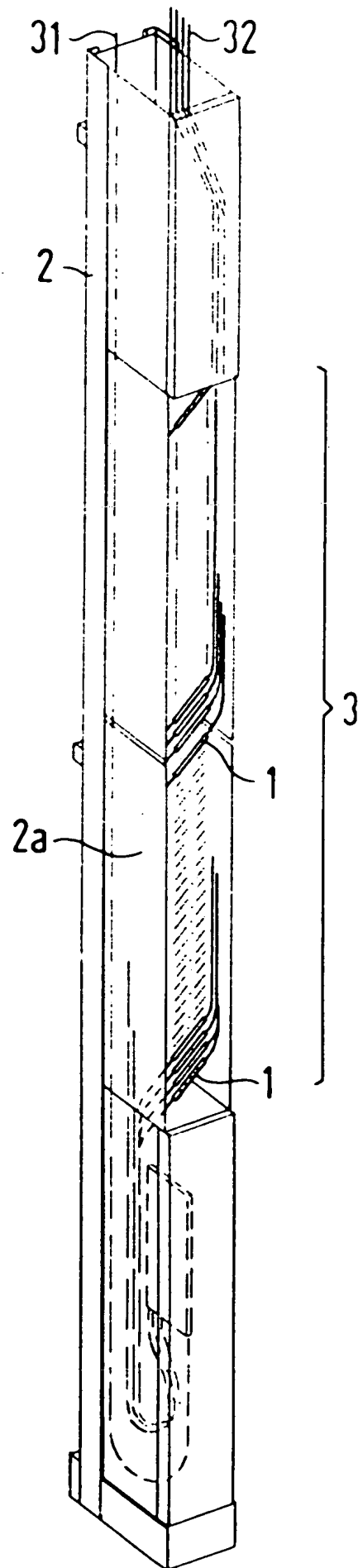


FIG 2

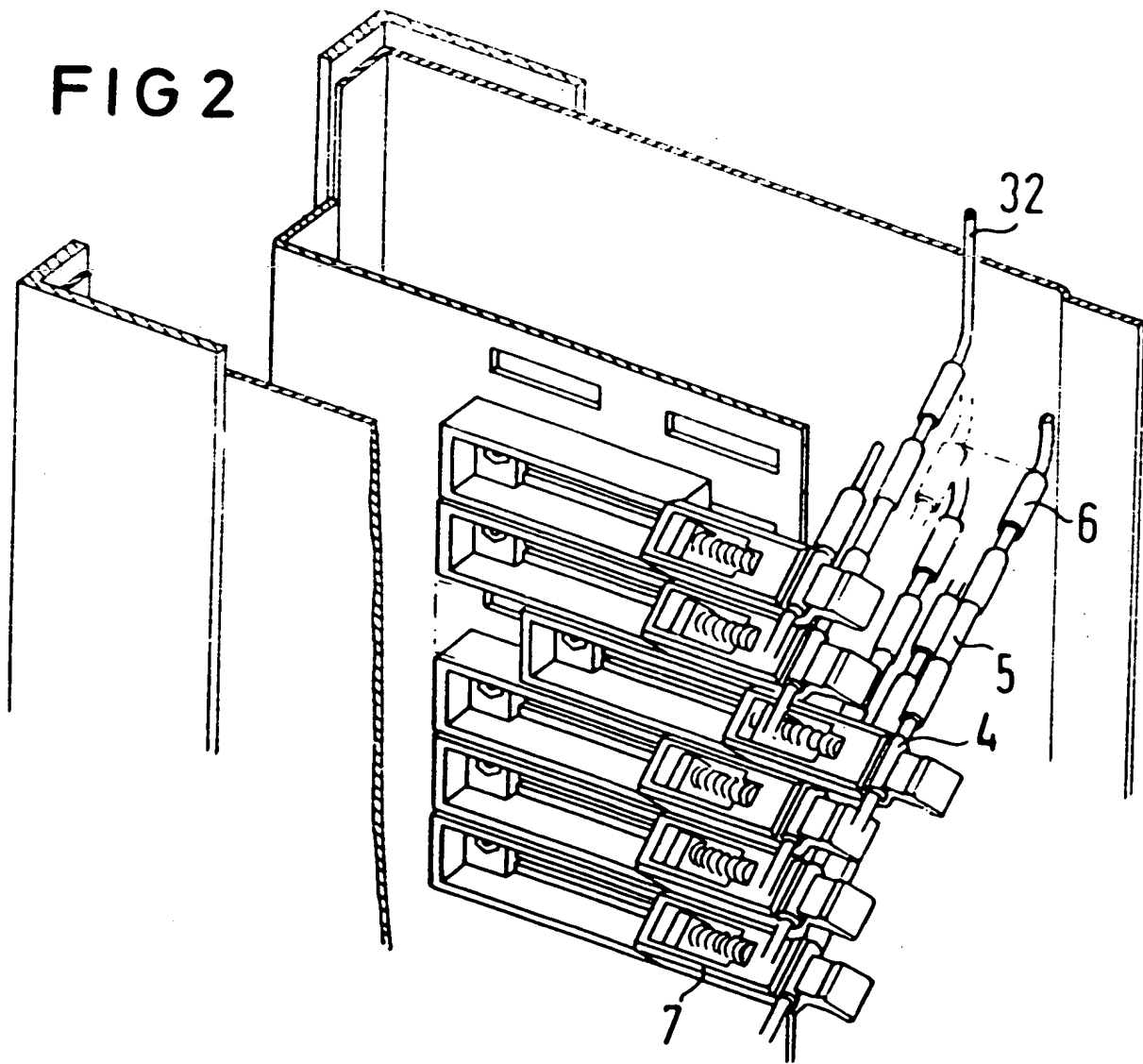
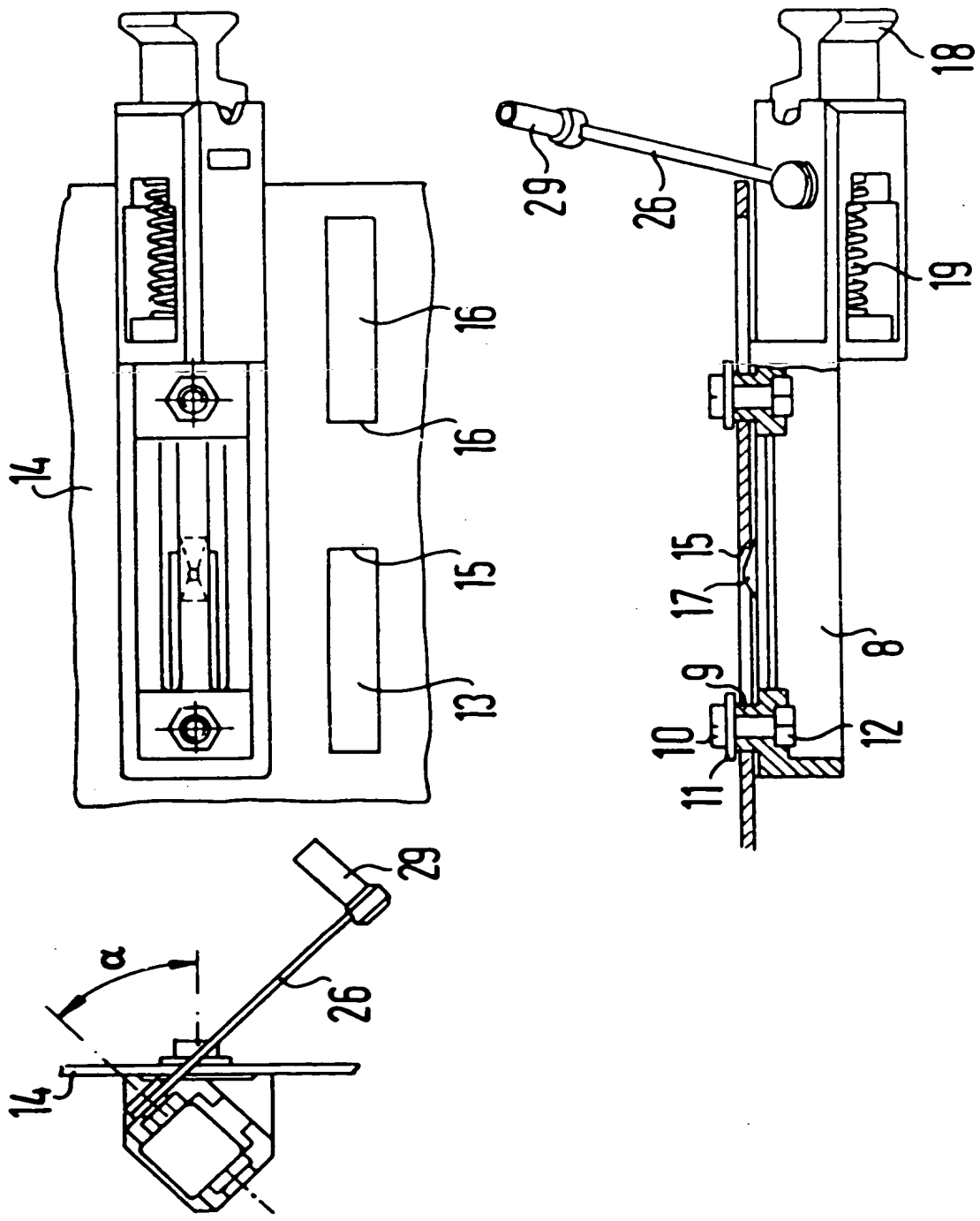




FIG 3



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FIG 4

